

UTILITY PATENT APPLICATION TRANSMITTAL

(Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
MUR-8410

Total Pages in this Submission

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

CASING CENTRALISER

and invented by:

Ian Alastair Kirk, William Barron, and Alistair Bertram Clark

If a CONTINUATION APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No.: PCT/GB98/00554

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having twelve (12) pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☒ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
a. ☐ Formal b. ☒ Informal Number of Sheets five (5)
4. ☒ Oath or Declaration
a. ☐ Newly executed *(original or copy)* ☒ Unexecuted
b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
c. ☒ With Power of Attorney ☐ Without Power of Attorney
d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche
7. ☐ Genetic Sequence Submission *(if applicable, all must be included)*
a. ☐ Paper Copy
b. ☐ Computer Readable Copy
c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☐ Assignment Papers *(cover sheet & documents)*
9. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
☐ First Class ☒ Express Mail *(Specify Label No.):* EJ483055120US

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Accompanying Application Parts (Continued)

15. Benefit of priority of U.K. Patent No. 9703608.1 filed 21 February 1997 is claimed under 35 USC 119 and 120.

16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: one (1)

17. ☒ Additional Enclosures (please identify below):

Copy of International Application Number PCT/GB98/00554; Interntl Filing Date: 23 February 1998.

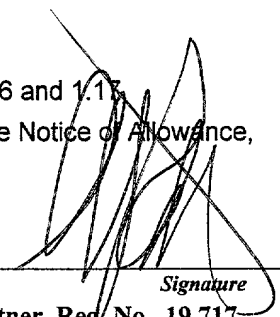
Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	20	- 20 =	0	x \$9.00	\$0.00
Indep. Claims	1	- 3 =	0	x \$39.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$380.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$380.00

- ☒ A check in the amount of \$380.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 18-0350 as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: August 23, 1999


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AUG 24 1999 11:07AM

Applicant or Patent: Eni Alaguir Kirk, William Barron, and Afeniy Barron Clark
 Serial or Patent No. PCT/GB98/00554
 Filed or Issued: 23 February 1998
 For: CASING CENTRALISER

Attorney's Docket No.: MUR-8410

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(c) and 1.77(c) - SMALL BUSINESS CONCERN

I hereby declare that I am

- ☐ the owner of the small business concern identified below;
☒ an official of the small business concern empowered to act on behalf of the concern identified below;

NAME OF CONCERN Downhole Products PLCADDRESS OF CONCERN Redcraze Road, Redcraze Park, Portlithy, Aberdeen AB12 4YA, UNITED KINGDOM

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(c), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement: (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled CASING CENTRALISER, by inventor(s) Eni Alaguir Kirk, William Barron, and Afeniy Barron Clark described in

- ☐ the specification filed herewith.
☒ application serial no. PCT/GB98/00554, filed 23 February 1998
☐ patent no. issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below and no rights in the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(c) or a nonprofit organization under 37 CFR 1.9(e).

*NOTE: Separate verified statements are required from each named person, concern or organization having rights in the invention according to their status as small entities. (37 CFR 1.21)

NAME: _____

ADDRESS: _____

☐ INDIVIDUAL☐ SMALL BUSINESS CONCERN☐ NONPROFIT ORGANIZATION

NAME: _____

ADDRESS: _____

☐ INDIVIDUAL☐ SMALL BUSINESS CONCERN☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING

William Barron

TITLE OF PERSON OTHER THAN OWNER

DIRECTOR

ADDRESS OF PERSON SIGNING

61 SEAFIELD ROAD, ABERDEEN, U.K.

SIGNATURE

William BarronDATE 23/08/99

1

1 "CASING CENTRALISER"

2

3 The invention relates to a casing centraliser. This
4 application is a Continuation-In-Part of PCT/GB98/00554
5 to which filing details have not yet been assigned by
6 the USPTO.

7

8 Background to the invention.

9 When a well has been drilled for the eventual
10 production of hydrocarbons, one of the procedures
11 commonly employed in readying the well for production
12 comprises installing hollow tubular casing in the well
13 to line the borehole. The space between the exterior
14 of the casing and the sides of the borehole are filled
15 with cement, which acts as a sealant and provides
16 mechanical support for the casing. As it is desirable
17 that the casing be centralized in the well bore when
18 cemented, proposals have been made for providing the
19 casing (prior to cementing) with externally mounted
20 centralisers to hold the casing away from the well bore
21 and towards the centre of the bore.

22

23 Summary of the invention.

1 longitudinally therethrough, the annular body being
2 formed from at least one material selected from the
3 group consisting of plastic material, elastomeric
4 material and rubber material, the substantially
5 cylindrical bore being a clearance fit around the
6 tubular casing to be centralised by the centraliser.

7
8 In a preferred embodiment the invention provides a
9 casing centraliser assembly comprising tubular casing
10 and a centraliser as defined above.

11
12 Typically, the plastic, elastomeric and/or rubber
13 material may comprise polytetrafluoroethylene (PTFE),
14 polyetheretherketone, carbon reinforced
15 polyetheretherketone, polyphthalamide, polyvinylidene
16 fluoride, polyphenylene sulphide, polyetherimide,
17 polyethylene, polysulphone, polyethersulphone,
18 polybutyleneterephthalate, polyetherketoneketone,
19 polyamides, rubber & rubber compounds, phenolic resins
20 or compounds, thermosetting plastics, thermoplastic
21 elastomers, thermoplastic compounds or thermoplastic
22 polyester resins.

23
24 In one example of the invention, the plastic,
25 elastomeric or rubber material may contain a filler
26 material, such as glass, carbon, PTFE, silicon,
27 molybdenum disulphide, graphite, oil or wax, or any
28 combination of these materials.

29
30 The annular body may be manufactured from and consist
31 of the plastic, elastomeric and/or rubber material.
32 However, the annular body may comprise a combination of
33 the plastic, elastomeric and/or rubber material and
34 another material such as a metal. For example, the
35 annular body may comprise a metal skeleton or other

1 structure coated, or partially coated, with the
2 plastic, elastomeric or rubber material. In addition,
3 or as an alternative, the annular body may comprise a
4 combination of different plastic, elastomeric and/or
5 rubber materials.

6
7 The annular body may be formed in one or more sections
8 which may be assembled around the tubular to be
9 centralised by the centraliser. In one embodiment the
10 annular body is divided into 2 sections along its axis
11 so that each section forms a "half shell" arrangement.
12 The concave surface of one section can be fitted direct
13 against one side of the outer surface of the tubular
14 and connected to another section similarly positioned
15 against the opposite side of the tubular. The 2
16 sections can then be connected around the tubular to
17 make up the centraliser so that it does not need to be
18 offered up to the end of the tubular. This can be very
19 useful in coil tubing applications.

20
21 The division between the sections need not be axial.

22
23 In some embodiments the sections can be hingedly
24 attached to one another. In others the 2 sections can
25 be separate. There can be more than 2 sections
26 provided. It is sufficient that the sections are
27 adapted to allow the centraliser to be placed around
28 the tubular without needing to be threaded over an end
29 of the tubular.

30
31 The sections are preferably held together by fixings
32 and/or hinges. Preferred fixings include bolts but
33 catches and locks can also be used.

34
35 Preferably the centraliser further comprises a

1 peripheral array of a plurality of longitudinally
2 extending blades circumferentially distributed around
3 said body to define a flow path between each
4 circumferentially adjacent pair of said blades, each
5 said flow path providing a fluid flow path between
6 longitudinally opposite ends of said centraliser, each
7 said blade having a radially outer edge providing a
8 well bore-contacting surface.

9
10 Said centraliser is preferably free of any means
11 tightly gripping a casing when said centraliser is
12 installed thereon, whereby said centraliser and said
13 casing are mutually rotatable.

14
15 Said blades are preferably mutually substantially
16 equidistantly distributed around said body. Said blades
17 preferably each extend circumferentially at least
18 part-way around said body between longitudinally
19 opposite ends thereof to provide a circumferential
20 distribution of each said well bore-contacting surface.
21 Each said blade preferably has a radially inner root
22 integral with said body, each said radially inner root
23 preferably being circumferentially wider than the
24 respective radially outer edge. Said blades are
25 preferably circumferentially wider at one end of the
26 centraliser than at the other end, said one end
27 preferably the lower end of the centraliser in use
28 thereof. Said centraliser preferably has five of said
29 blades.

30
31 Longitudinally opposite ends of said blades and/or of
32 said body may be chamfered or tapered whereby to
33 facilitate passage of said centraliser down a well
34 bore.

35

1 Brief description of the drawings.

2 Examples of a casing centraliser in accordance with the
3 invention will now be described with reference to the
4 accompanying drawings, in which:-

5

6 Fig. 1 is a perspective view from above and to one
7 side of a first example of a casing centraliser;
8 Fig. 2 is a plan view from above of the first
9 example;

10 Fig. 3 is an underneath view of the first example;
11 Figs. 4 and 5 are respectively radial (plan) and
12 circumferential (side) views of a blade forming
13 part of the first example;

14 Fig. 6 is a perspective view of a casing
15 centraliser mounted on casing in a borehole;

16 Fig 7a shows a side view of a second centraliser
17 on a tubular, Fig 7b shows the same centraliser in
18 plan view, and Fig 7c shows the same centraliser
19 in exploded plan view.

20

21 Description of preferred embodiments.

22 Referring first to Figs. 1 to 3, a casing centraliser
23 10 is a unitary annulus comprising a generally
24 cylindrical body 12, and an array of five
25 equiangularly-spaced blades 14 integrally formed with
26 the body 12. A cylindrical bore 16 extends
27 longitudinally and coaxially through the body 12, the
28 bore 16 having a substantially uniform diameter
29 dimensioned to be a clearance fit around the well bore
30 casing (not shown in Figs. 1 to 3). Each of the blades
31 14 (see also Figs. 4 and 5) not only extends between
32 longitudinally opposite ends of the body 12, but also
33 extends circumferentially part-way around the periphery
34 of the centraliser 10. The skewing of the blade 14
35 ensures that their respective radially outer edges 18

6

1 collectively provide a circumferentially substantially
2 uniform well bore-contacting surface for the
3 centraliser 10, as most particularly shown in Figs. 2
4 and 3.

6 Each of the blades 14 has a respective radially inner
7 root 20 integral with the body 12. In each of the
8 blades 14, the root 20 has a greater circumferential
9 width than the outer edge 13, ie the cross-section of
10 each blade 14 tapers towards the well bore-contacting
11 periphery of the centraliser 10. The individual and
12 collective shapes of the blades 14, and of the
13 longitudinal fluid flow passages defined between
14 adjacent pairs of the blades 14, gives the centraliser
15 10 improved flow characteristics and minimises the
16 build-up of trapped solids during use of the
17 centraliser 10.

19 Longitudinally opposite ends of the blades 14, and of
20 the body 12, are chamfered to assist in movement of the
21 centraliser 10 up/down a well bore.

23 Although the blades 14 are shown separately from the
24 body 12 in Figs 4 and 5 (and while the blades 4 could
25 be separately formed and subsequently attached to the
26 body 12 by any suitable means) it is preferred that the
27 entire centraliser 10 is fabricated as a one-piece
28 article.

30 The centraliser 10 may be manufactured entirely from a
31 plastics, elastomeric and/or rubber material.
32 Alternatively, the centraliser may comprise a metal
33 body coated, or partially coated, with a plastic,
34 elastomeric and/or rubber material.

35

7

1 Examples of possible plastic, elastomeric and/or rubber
2 materials are polytetrafluoroethylene (PTFE),
3 polyetheretherketone, carbon reinforced
4 polyetheretherketone, polyphthalamide, polyvinylidene
5 fluoride, polyphenylene sulphide, polyetherimide,
6 polyethylene, polysulphone, polyethersulphone,
7 polybutyleneterephthalate, polyetherketoneketone,
8 polyamides, rubber & rubber compounds, phenolic resins
9 or compounds, thermosetting plastics, thermoplastic
10 elastomers, thermoplastic compounds or thermoplastic
11 polyester resins.

12
13 The plastics, elastomeric and/or rubber material may
14 contain a filler. Examples of possible fillers are
15 glass, carbon, PTFE, silicon, molybdenum disulphide,
16 graphite, oil or wax, or any combination of these
17 materials.

18
19 Use of a plastic, elastomeric and/or rubber material
20 gives a number of advantages, including:- chemical
21 resistance, such as resistance to acid; non-sparking
22 (ie sparks are not generated if the centraliser 10
23 collides with steel); and, materials such as PTFE give
24 superior bearing properties.

25
26 Since the bore 16 is a clearance fit around the casing
27 and since the bore 16 lacks any means of tightly
28 gripping a normally dimensioned casing, the centraliser
29 10 can not only rotate freely around the casing but
30 also move freely along the casing (unless and until the
31 centraliser collides with an obstruction, for example a
32 protruding casing joint). Thus to provide longitudinal
33 restraint for the centraliser 10 to retain the
34 centraliser substantially at its preferred location
35 along the casing but without impairing the relative

1 rotatability of centraliser and casing, use is made of
2 a stop collar 50, as illustrated in Fig. 6.

3

4 Fig. 6 shows a modified form of casing centraliser 100,
5 fitted around hollow tubular casing 102 which is
6 located within a well bore 104. The modified
7 centraliser 100 is essentially the same as the
8 centraliser 10 described above, and differs principally
9 in the dimensions and proportions of its blades 106.
10 In particular, the blades 106 are circumferentially
11 wider at the lower end of the centraliser 100 than they
12 are at the upper end. Fig. 6 also illustrates the
13 manner in which the centraliser will hold casing out of
14 direct contact with the well bore and centrally within
15 the well bore, in preparation for subsequent cementing.

16

17 Fig 7 shows a modified plastic centraliser 110 located
18 around a length of casing 112. The centraliser 110 has
19 blades R1, R2, R3 and R4 spaced around its outer
20 surface to contact the inner surface of the wellbore
21 and to centralise the casing 112 therein. The blades R
22 extend axially along the centraliser but can
23 alternatively extend around the outer circumference of
24 the centraliser like the blades 106.

25

26 The centraliser 110 is axially divided along the
27 midline of opposing blades R2 and R4 to form two half
28 shells 110a and 110b, so that the blades R2 and R4 are
29 formed only when the opposing faces F of the half
30 shells 110a and 110b are joined together. Half shell
31 110a has two threaded sockets S in each of the faces F
32 of R2 and R4 to receive bolts B protruding through the
33 faces F of the other half shell 110b. The bolts B
34 engage in the sockets S and pull the faces F together
35 when the centraliser 110 is made up around the casing

1 112 and the bolts tightened.

2

3 The centraliser 110 can be formed from
4 polytetrafluoroethylene (PTFE), polyetheretherketone,
5 carbon reinforced polyetheretherketone,
6 polyphthalamide, polyvinylidene fluoride,
7 polyphenylene sulphide, polyetherimide, polyethylene,
8 polysulphone, polyethersulphone,
9 polybutyleneterephthalate, polyetherketoneketone,
10 polyamides, rubber & rubber compounds, phenolic resins
11 or compounds, thermosetting plastics, thermoplastic
12 elastomers, thermoplastic compounds or thermoplastic
13 polyester resins.

14

15 The centraliser 110 is useful with coil tubing
16 applications, but may also be used for casing and
17 screens to afford protection from acids and other
18 harmful chemicals downhole.

19

20 In the case of casing located within larger diameter
21 casing, centralisers can be employed on the inner
22 casing to hold it out of direct contact with the outer
23 casing.

24

25 Advantages of the invention are that the use of a
26 plastics, elastomeric and/or rubber material for the
27 centraliser helps to provide chemical resistance, such
28 as resistance to corrosion from acid. Other advantages
29 are that the materials are generally non sparking and
30 that certain materials, for example PTFE, have superior
31 bearing properties.

32

10

1 Claims:

2 1 A casing centraliser comprising an annular body,
3 the annular body having a substantially cylindrical
4 bore extending longitudinally therethrough, the annular
5 body being formed from at least one material selected
6 from the group consisting of plastic material,
7 elastomeric material and rubber material, the
8 substantially cylindrical bore being a clearance fit
9 around the tubular casing to be centralised by the
10 centraliser.

11
12 2 A casing centraliser as claimed in claim 1 wherein
13 the material is selected from the group consisting of
14 polytetrafluoroethylene (PTFE), polyetheretherketone,
15 carbon reinforced polyetheretherketone,
16 polyphthalamide, polyvinylidene fluoride,
17 polyphenylene sulphide, polyetherimide, polyethylene,
18 polysulphone, polyethersulphone,
19 polybutyleneterephthalate, polyetherketoneketone,
20 polyamides, rubber & rubber compounds, phenolic resins
21 or compounds, thermosetting plastics, thermoplastic
22 elastomers, thermoplastic compounds and thermoplastic
23 polyester resins.

24
25 3 A casing centraliser as claimed in claim 1,
26 wherein the material contains a filler material.

27
28 4 A casing centraliser as claimed in claim 3 wherein
29 the filler material is selected from the group
30 consisting of glass, carbon, PTFE, silicon, molybdenum
31 disulphide, graphite, oil and wax.

32
33 5 A casing centraliser assembly as claimed in claim
34 1, wherein the annular body is of unitary construction.

35

11

1 6 A casing centraliser as claimed in claim 1,
2 wherein the annular body comprises a combination of at
3 least two different materials.

4
5 7 A casing centraliser as claimed in claim 1,
6 wherein the annular body comprises a metal skeleton at
7 least partially coated with said material.

8
9 8 A casing centraliser as claimed in claim 1, having
10 a peripheral array of a plurality of longitudinally
11 extending blades circumferentially distributed around
12 the body of the centraliser to define a flow path
13 between each circumferentially adjacent pair of said
14 blades, each said flow path providing a fluid flow path
15 between longitudinally opposite ends of said
16 centraliser, each said blade having a radially outer
17 edge providing a well bore-contacting surface.

18
19 9 A casing centraliser as claimed in claim 8,
20 wherein the blades are mutually substantially
21 equidistantly distributed around the body.

22
23 10 A casing centraliser as claimed in claim 8,
24 wherein the blades each extend circumferentially at
25 least part-way around said body between longitudinally
26 opposite ends thereof to provide a circumferential
27 distribution of each said well bore-contacting surface.

28
29 11 A casing centraliser as claimed in claim 8,
30 wherein each blade has a radially inner root integral
31 with said body, each said radially inner root
32 preferably being circumferentially wider than the
33 respective radially outer edge.

34
35 12 A casing centraliser as claimed in claim 8,

12

1 wherein the blades are circumferentially wider at a
2 lower end of the centraliser than at the upper end.

4 13 A casing centraliser as claimed in claim 8,
5 wherein said centraliser has five of said blades.

14 A casing centraliser as claimed in claim 1,
substantially free of any means tightly gripping a
casing when said centraliser is installed thereon,
whereby said centraliser and said casing are mutually
rotatable.

13 15 A casing centraliser assembly comprising tubular
14 casing and a centraliser as claimed in claim 1.

16 16 A casing centraliser as claimed in claim 1,
17 wherein the annular body is divided along its axis into
18 at least two inter-connectable sections.

17 A casing centraliser as claimed in claim 16,
wherein each of said at least two inter-connectable
sections is adapted to allow the centraliser to be
placed around the tubular without needing to be
threaded over an end of the tubular.

26 18 A casing centraliser as claimed in claim 16,
27 wherein the division between the sections is not axial.

19 A casing centraliser as claimed in claim 16,
wherein the sections are hingedly attached to one
another.

33 20 A casing centraliser as claimed in claim 16,
34 wherein the sections are held together by fixings.

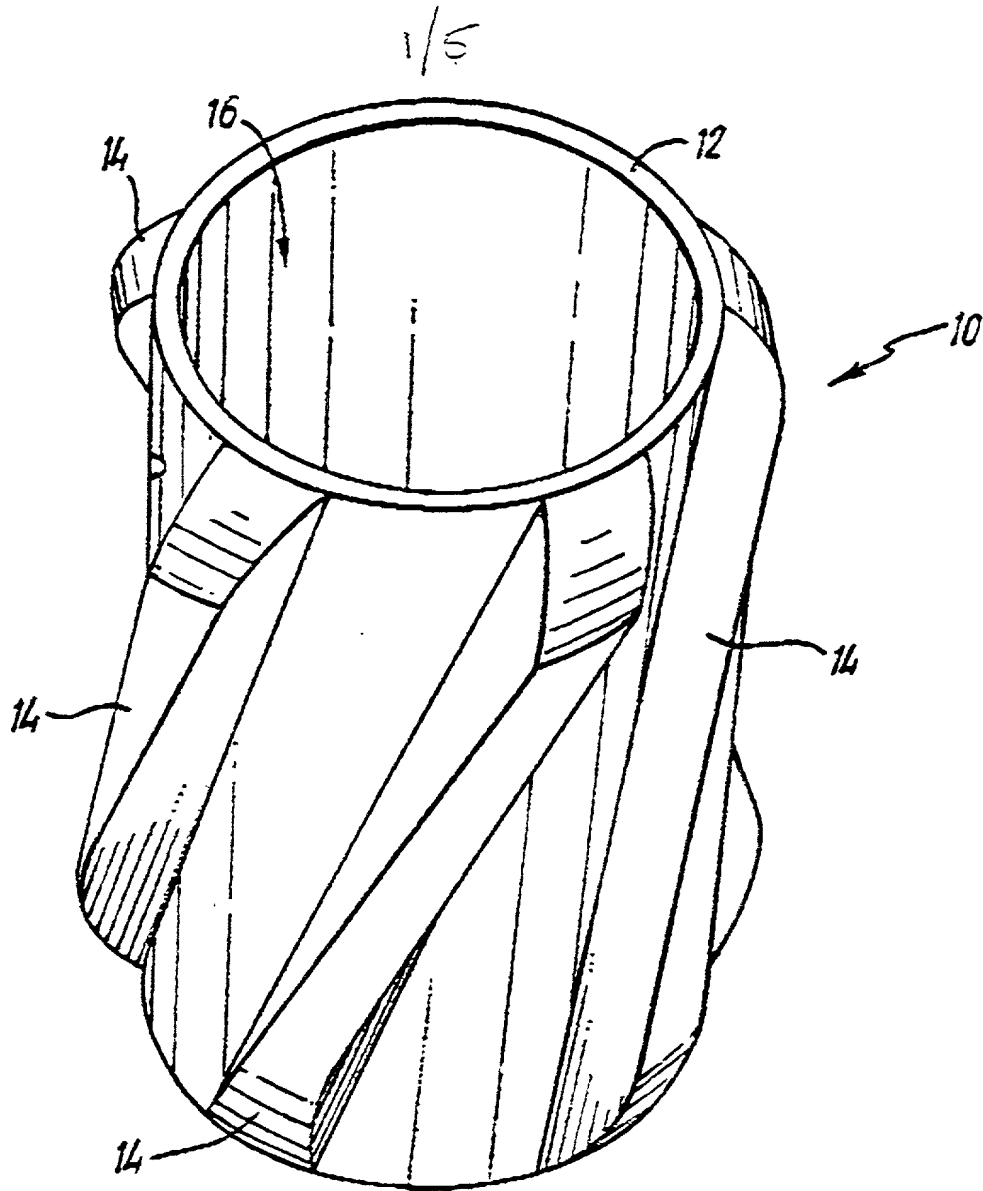
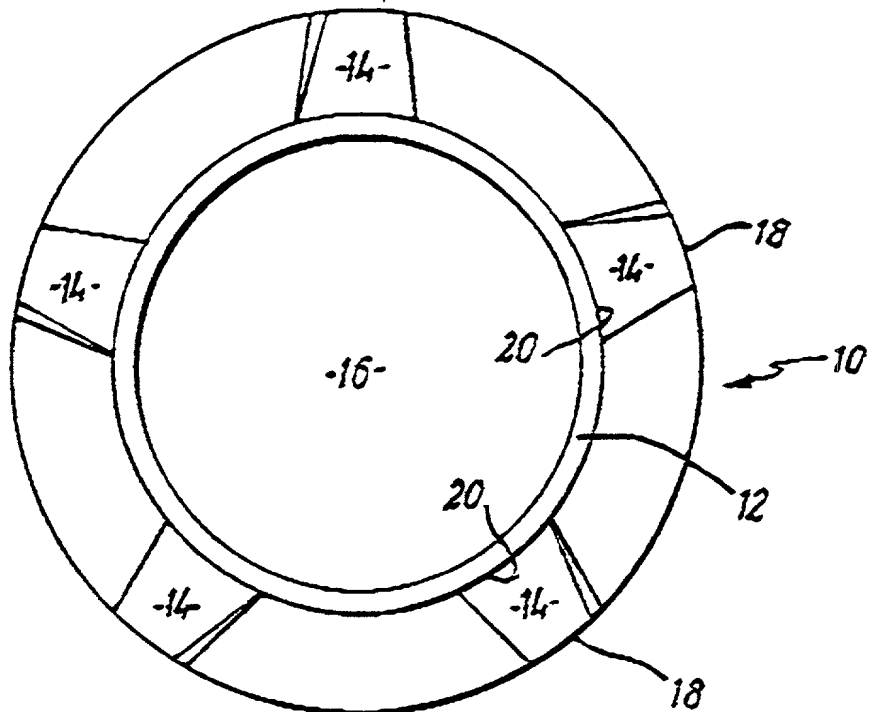
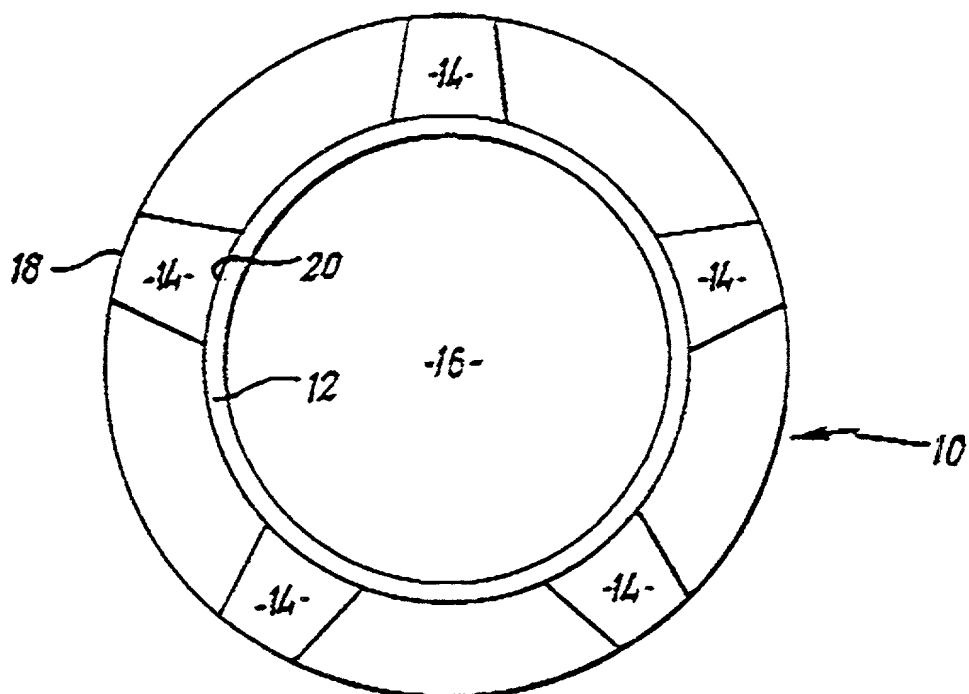


FIG. 1



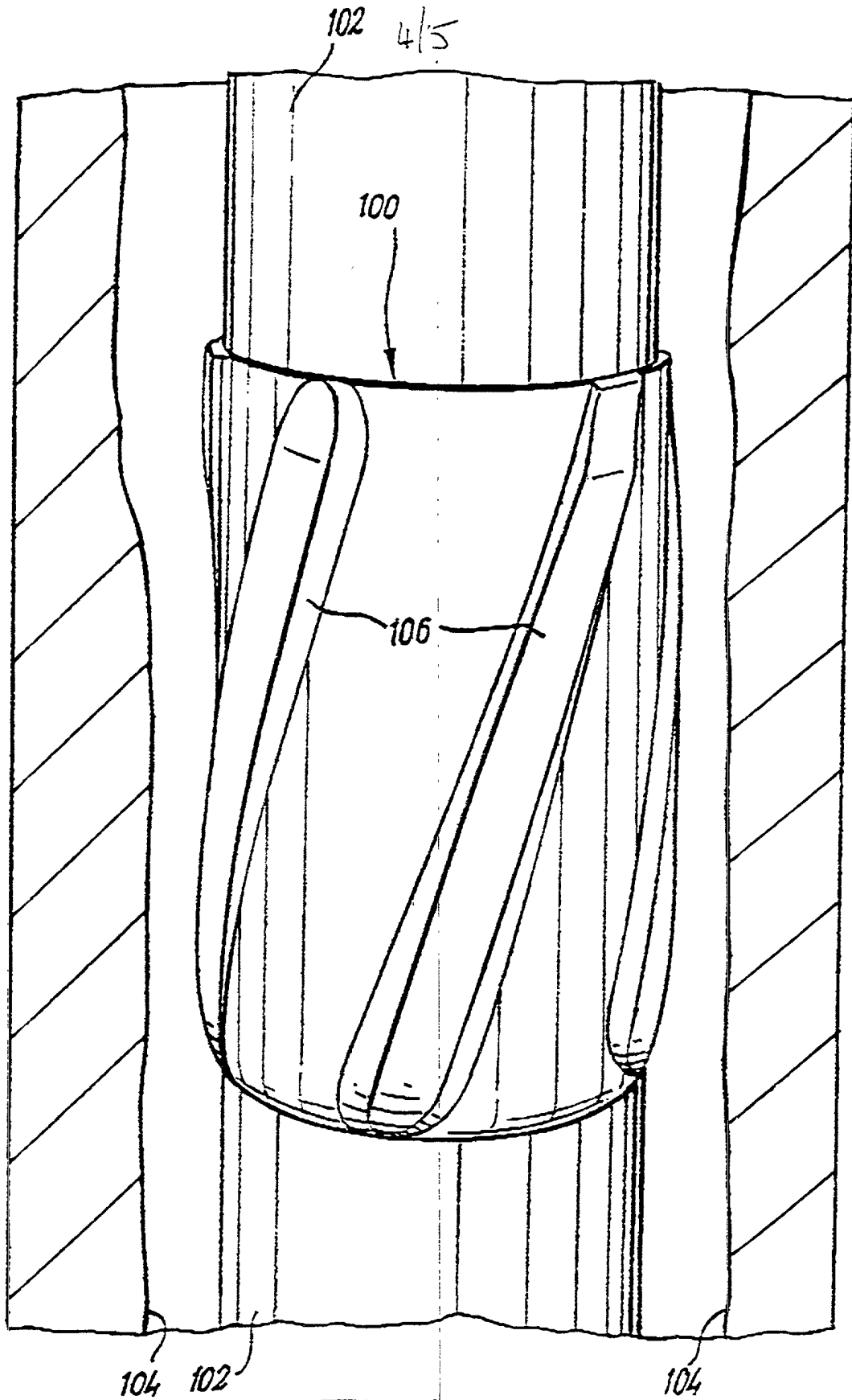
FTE.2



File 3

A diagram of a lens, labeled 18, which is a biconvex lens. The lens is shown in cross-section, with a central vertical axis. The left surface is convex, and the right surface is also convex. The label 18 points to the left surface, and the label 20 points to the right surface.

FTE.5

[illegible]

FTE 6

Fig. 7a

s/s

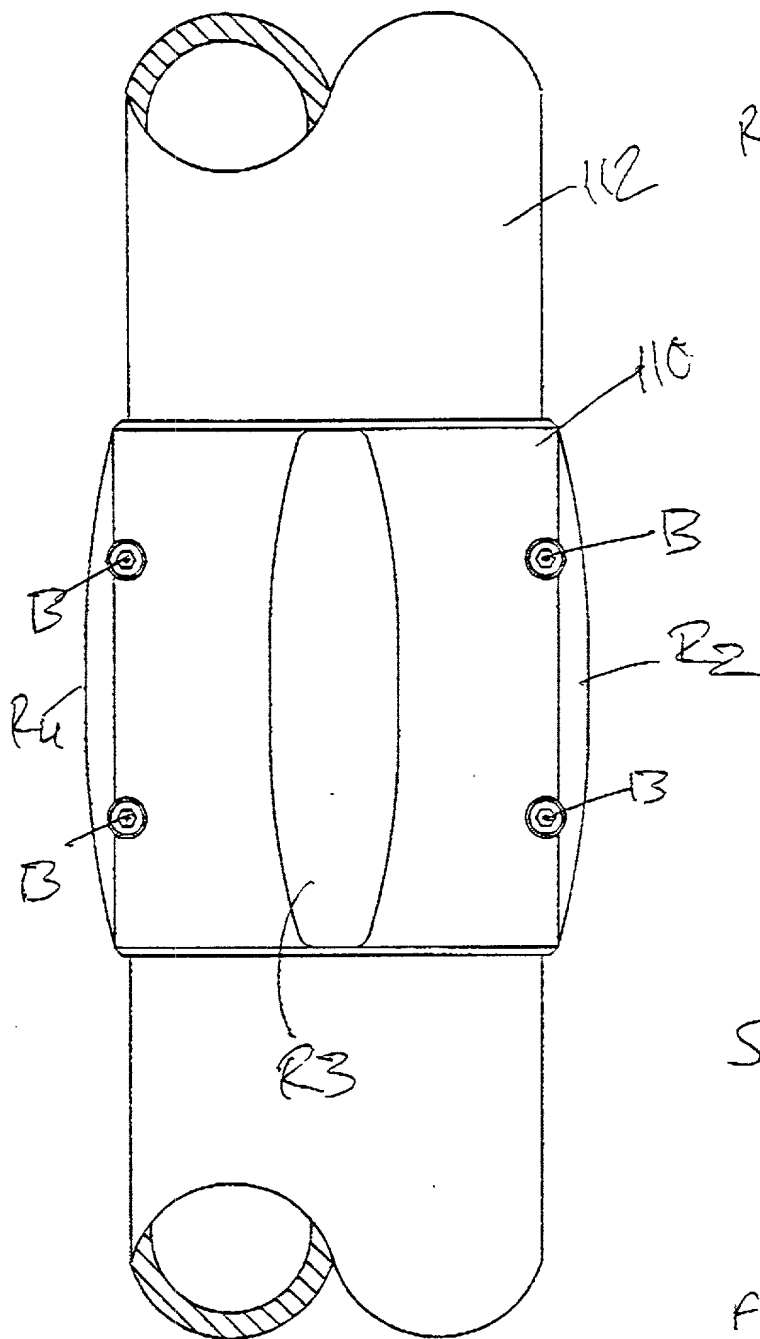


Fig. 7b

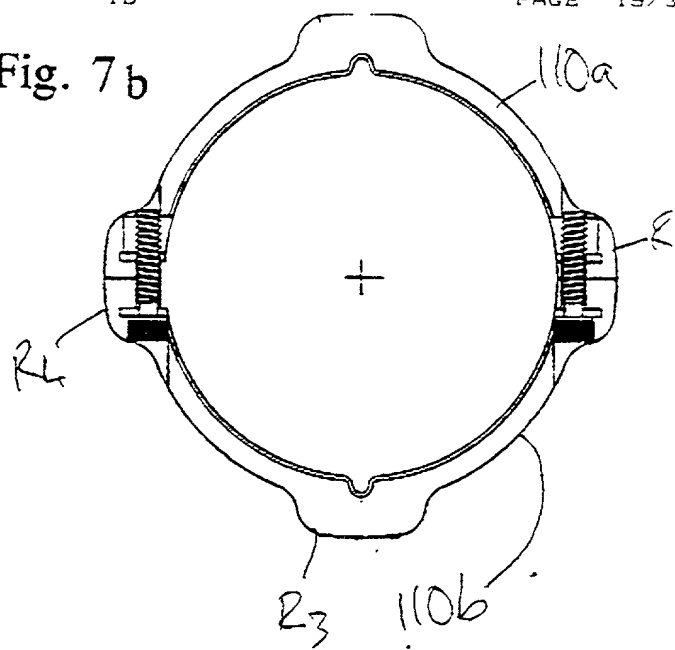
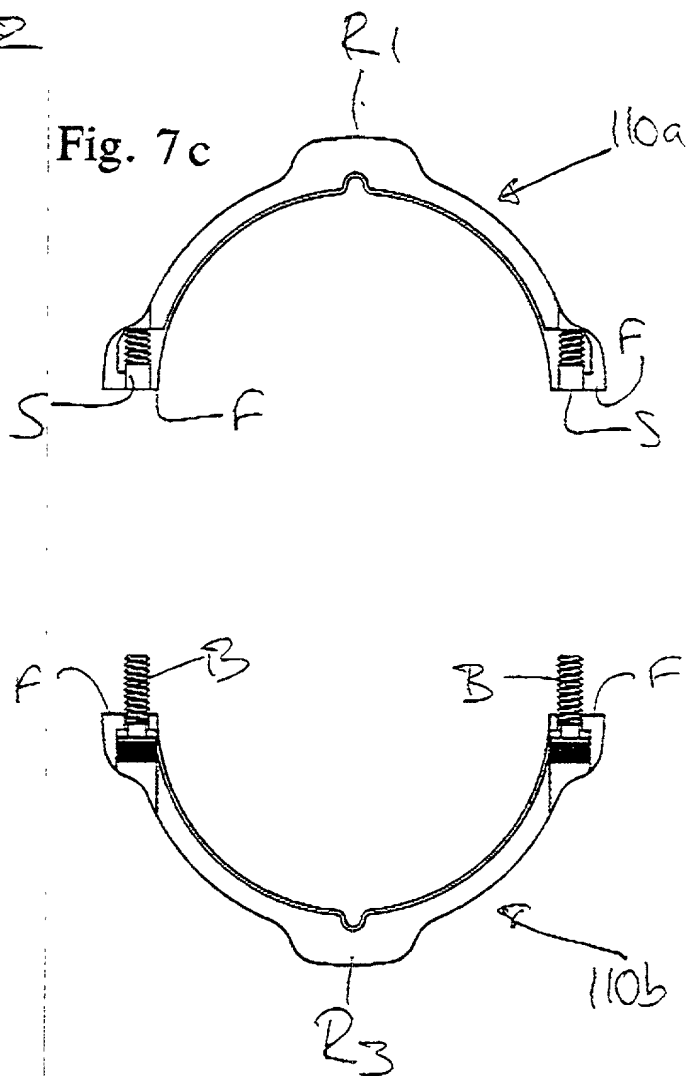


Fig. 7c



Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

CASING CENTRALISER,

the specification of which is attached hereto unless the following box is checked:

☐ was filed on 23 February 1998 as
United States Application Number or PCT International Application Number PCT/GB98/00554
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Not Claimed

9703608.1 GB 21 February 1997

(Number) (Country) (Day/Month/Year Filed) ☐

(Number) (Country) (Day/Month/Year Filed) ☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

(Application Number) (Filing Date)

(Application Number) (Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

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(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Fifth inventor's signature _____ Date _____

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Full name of sixth joint inventor, if any (given name, family name) _____

Sixth inventor's signature _____ Date _____

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Full name of seventh joint inventor, if any (given name, family name) _____

Seventh inventor's signature _____ Date _____

Residence _____

Citizenship _____

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